

CLAIMS

What is Claimed is:

- 5 1. A time sensitive quality of service management system comprising:
a communication port for communicating information;
a switching circuit for providing an output communication path to
said communication port, said switching circuit coupled to said
communication port;
10 a processor for directing said switching circuit to perform cut through
routing, said processor coupled to said switching circuit; and
a memory for storing information associated with the control of said
switching circuit by said processor, said memory coupled to said processor.
- 15 2. A time sensitive quality of service management system of Claim 1
wherein said processor analyzes incoming information and determines if the
incoming information has time sensitive characteristics.
- 20 3. A time sensitive quality of service management system of Claim 2
wherein said processor directs said time sensitive quality of service
management system to drop said incoming information with time sensitive
characteristics if said switching circuit can not output said information within
specified timing constraints.

4. A time sensitive quality of service management system of Claim 2
wherein said processor directs said time sensitive quality of service
management system to drop said incoming information with time sensitive
5 characteristics if said switching circuit is busy performing other switching
operations.

5. A time sensitive quality of service management system of Claim 2
wherein said processor directs said switch to forward said time sensitive
10 information upon receipt and analysis destination information in the header.

6. A time sensitive quality of service management system of Claim 2
wherein said time sensitive information is forwarded.

15 7. A time sensitive quality of service management system of Claim 2
wherein said time sensitive quality of service management system functions
as an end use device.

8. A time sensitive quality of service management system of Claim 2
20 wherein the time sensitive information is compatible with TCP/IP standards.

9. A time sensitive quality of service management system of Claim 2 wherein the information is considered urgent if it is addressed to a port associated with a timing sensitive device.

5 10. A time sensitive quality of service management system of claim 1 further comprising a buffer circuit for storing non time sensitive information temporarily when directed by said processor and the information is forwarded according to queuing characteristics of said buffer.

10 11. A time sensitive quality of service management method comprising the steps of:

receiving information by an intermediate network device;

determining transmission timing constraints of said intermediate network device;

15 sending the information to downstream devices by the intermediate network device if the intermediate device is available for sending information to downstream devices within specified timing constraints;

analyzing the timing constraints of the information by the intermediate network device; and

20 dropping the information if the intermediate device is not available for sending to downstream devices within specified timing constraints.

12. A time sensitive quality of service management method of claim 11 wherein the information is compatible with TCP/IP standards.

13. A time sensitive quality of service management method of claim 11 wherein said determination is directed to determining if a communication path to a downstream device is busy and will be unavailable within specified timing constraints.

14. A time sensitive quality of service management method of claim 11 wherein a cut through process is performed to resend the information.

15. A time sensitive quality of service management method of claim 14 wherein during the cut through process a packet of information is switched to the down stream channels as soon the header indicating the timing constraints of the information is received and analyzed.

16. A time sensitive quality of service management method of claim 11 wherein a communication packet header includes a timing constraint indicator.

17. A time sensitive quality of service management method of claim 16 wherein the information is considered urgent if it is addressed to a port associated with a time sensitive device.

18. A time sensitive quality of service management method of claim 17 wherein the time sensitive device is a real time device.

5 19. A time sensitive quality of service management method of claim 17 wherein the information is buffered and forwarded if the timing constraints indicate the information is not time sensitive.

10 20. A time sensitive quality of service management method of claim 17 wherein the time sensitive information is cut through a router and resent or it is dropped.

15 21. A time sensitive quality of service management system comprising:
a communication port for communicating information;
a switching circuit for providing an output communication path to
said communication port, said switching circuit coupled to said
communication port;

20 a processor for directing said switching circuit to perform pre-emptive
cut through routing over a virtual communications channel, said processor
coupled to said switching circuit; and

a memory for storing information associated with the control of said
switching circuit by said processor, said memory coupled to said processor.

22. A time sensitive quality of service management system of Claim 1 wherein said processor analyzes incoming information and determines if the incoming information has time sensitive characteristics.

5 23. A time sensitive quality of service management system of Claim 22 wherein said processor directs said time sensitive quality of service management system to drop said incoming information with time sensitive characteristics if said switching circuit can not output said information within specified timing constraints.

10 24. A time sensitive quality of service management system of Claim 22 wherein said processor directs said time sensitive quality of service management system to drop said incoming information with time sensitive characteristics if said switching circuit is busy performing other switching
15 operations.

20 25. A time sensitive quality of service management system of Claim 22 wherein said processor directs said switch to forward said time sensitive information upon receipt and analysis destination information in the header, said time sensitive information is forwarded on said virtual communication channel.

26. A time sensitive quality of service management system of Claim 22 wherein said communication time sensitive information pre-empts communication of other non-time sensitive information.

5 27. A time sensitive quality of service management system of Claim 22 wherein said virtual communication channel is only utilized to communicate time sensitive information.

10 28. A time sensitive quality of service management system of Claim 22 wherein the time sensitive information is compatible with TCP/IP standards.

29. A time sensitive quality of service management system of Claim 22 wherein the information is considered urgent if it is addressed to a port associated with a time sensitive device.

15 30. A time sensitive quality of service management system of claim 21 further comprising a buffer circuit for storing non sensitive information temporarily when directed by said processor and the information is forwarded according to queuing characteristics of said buffer.

20 31. A time sensitive quality of service management system comprising:
a communication port for communicating information;

a switching circuit for providing an output communication path to said communication port, said switching circuit coupled to said communication port;

5 a processor for directing said switching circuit to perform cut through routing of a communication path probe and a communication path probe update, said processor coupled to said switching circuit; and

a memory for storing information associated with the control of said switching circuit by said processor, said memory coupled to said processor.

10 32. A time sensitive quality of service management system of Claim 31 wherein said processor analyzes incoming information and determines if the incoming information has time sensitive characteristics.

15 33. A time sensitive quality of service management system of Claim 32 wherein said processor directs said time sensitive quality of service management system to drop said incoming information with time sensitive characteristics if said switching circuit can not output said information within specified timing constraints.

20 34. A time sensitive quality of service management system of Claim 32 wherein said processor directs said time sensitive quality of service management system to drop said incoming information with time sensitive

characteristics if said switching circuit is busy performing other switching operations.

35. A time sensitive quality of service management system of Claim 32

5 wherein said processor directs said switch to add identification information to said communication path probe and forward said communication path probe by cut-through routing upon receipt and analysis of destination information in said communication probe.

10 36. A time sensitive quality of service management system of Claim 32

wherein said processor directs said switch to forward said communication path probe update upon receipt and analysis of source information in said communication probe update..

15 37. A time sensitive quality of service management system of Claim 32

wherein said communication path probe update includes information utilized to establish a communication path from a source to a destination.

38. A time sensitive quality of service management system of Claim 32

20 wherein the time sensitive information is compatible with TCP/IP standards.

39. A time sensitive quality of service management system of Claim 32 wherein the information is considered urgent if it is addressed to a port associated with a time sensitive device.

5 40. A time sensitive quality of service management system of claim 31 further comprising a buffer circuit for storing non sensitive information temporarily when directed by said processor and the information is forwarded according to queuing characteristics of said buffer.

10 41. A time sensitive quality of service management system comprising:
a communication port for communicating information;
a switching circuit for providing an output communication path to said communication port, said switching circuit coupled to said communication port;

15 a processor for directing said switching circuit to perform cut through routing and communication path recovery, said processor coupled to said switching circuit; and

a memory for storing information associated with the control of said switching circuit by said processor, said memory coupled to said processor.

20 42. A time sensitive quality of service management system of Claim 41 wherein said processor analyzes incoming information and determines if the incoming information has time sensitive characteristics and directs said time

sensitive quality of service management system to drop said incoming information with time sensitive characteristics if said switching circuit can not output said information within specified timing constraints.

- 5 43. A time sensitive quality of service management system of Claim 41 wherein said processor analyzes if a communication link to a first network device is unavailable and forwards said information to a second network device if said communication link to a first network device is unavailable.
- 10 44. A time sensitive quality of service management system of Claim 43 wherein said second network device indicates it is not able to establish a communication path to a final destination said processor forwards said information to a third network device.
- 15 45. A time sensitive quality of service management system comprising:
a communication port for communicating information;
a switching circuit for providing an output communication path to said communication port, said switching circuit coupled to said communication port;
- 20 a processor for directing said switching circuit to perform cut through routing and utilize information associated with previously establish communication paths to establish a new communication path, said processor coupled to said switching circuit; and

a memory for storing information associated with the control of said switching circuit by said processor, said memory coupled to said processor.

46. A time sensitive quality of service management system of Claim 45
5 wherein said processor analyzes incoming information and determines if the incoming information has time sensitive characteristics and directs said time sensitive quality of service management system to drop said incoming information with time sensitive characteristics if said switching circuit can not output said information within specified timing constraints.

10 47. A time sensitive quality of service management system of Claim 46 wherein said processor utilizes information about a previous downstream path from an intermediate network device to a destination to establish a communication path for a different source.

15 48. A time sensitive quality of service management method comprising the steps of:

receiving information by an intermediate network device;

determining transmission timing constraints of said intermediate

20 network device;

sending the information to downstream devices by the intermediate network device if the intermediate device is available for sending said information to downstream devices within specified timing constraints;

analyzing the timing constraints of the information by the
intermediate network device; and

dropping said information if the intermediate device is not available
for sending said information to downstream devices within specified timing
5 constraints.

49. A time sensitive quality of service management method of claim 49
wherein a cut through process is performed to resend the information.

10 50. A time sensitive quality of service management method of claim 49
wherein during the cut through process a communication path probe is
forwarded to downstream channels as soon communication path probe is
received and analyzed.

15 51. A time sensitive quality of service management method of claim 50
wherein said communication path probe includes information on the final
destination and the communication path the probe has traveled.

20 52. A time sensitive quality of service management method of claim 51
further comprising the step of receiving a communication path probe update
and forwarding said communication path probe update to upstream devices.

53. A time sensitive quality of service management method of claim 51 further comprising the steps of

receiving time sensitive information intended for a final destination by an intermediate network device;

5 determining if an intermediate network device has communicated information along a first communication path that is included in a second communication path for time sensitive information intended for a final destination; and

10 communicating communicates the information along the first communication path.

54. A time sensitive quality of service management method of claim 51 further comprising the steps of

selecting a first communication link is in a first communication path;

15 and

analyzing if the first communication link with the second intermediate network is available.

55. A network management system comprising:

20 a communication port for communicating information;

a switching circuit for providing an output communication path to said communication port, said switching circuit coupled to said communication port;

a processor for directing said switching circuit to perform cut through routing of a communication path probe utilized to establish a communication path for communicating non-time sensitive information, said processor coupled to said switching circuit; and

- 5 a memory for storing information associated with the control of said switching circuit by said processor, said memory coupled to said processor.

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